

REMARKS

Claims 2-4 and 11-15 are pending in this application and have been rejected.

Claims 2-4, 14 and 15 have been amended. Claims 2-4, 14 and 15 are independent.

Claims 2-4, 14 and 15 have been revised to clarify that the spent ink bag is positioned in a vacuum chamber; this feature is supported in the specification at page 14, lines 17-20, and in Fig. 14, for example. Those claims also have been amended to clarify that the charging step is performed under vacuum; this feature is supported in the specification at page 17, lines 16-17, for example.

The Examiner is thanked for the telephonic interview conducted on November 16, 2007. This Amendment proceeds in a manner consistent with the discussions during that interview.

Claims 2-4 and 11-15 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over German Patent Appln. No. 34 01 071 A1 to Vollert in view of U.S. Patent No. 5,903,292 to Scheffelin et al. and U.S. Patent No. 4,253,103 to Heinzl et al. Applicants respectfully traverse this rejection and submit the following arguments in support thereof.

As explained in detail below, all of the pending independent claims have been revised to clarify that this invention concerns a method that includes placing a spent ink bag into a vacuum chamber and charging that ink bag with ink while the ink bag is under vacuum, along with various other steps. Also, each of these claims provides for pressing the ink bag with a pressing plate, and charging the spent ink bag only through an opening that is not the opening through which the ink bag was originally filled. Taken together, the claimed method distinguishes over the teachings of the cited art.

Claim 2 involves a method of refilling a spent ink bag for use in an ink jet recorder. This includes the steps of providing the spent ink bag, the spent ink bag having an ink supply port that is selectively engageable with the ink jet recorder, positioning the spent ink bag in a vacuum chamber, inserting an ink needle into the ink supply port of the spent ink bag, pressing the spent ink bag with a pressing plate, discharging ink from the spent ink bag only through the port, the discharging being caused, at least in part, by the pressing of the spent ink bag with the pressing plate. After the discharging step, charging of the spent ink bag takes place only through the port with a specified quantity of ink in a vacuum.

Applicant's invention, as described in claim 3, is a method of refilling an ink bag for use in an ink jet recorder, the ink bag having a flexible bag portion having an interior and being initially filled with ink through a first opening in the bag that is sealed after the ink bag is initially filled. This method involves providing an ink bag, the ink bag having a second opening that is different than the first opening, the second opening being an ink supply port selectively engageable with the ink jet recorder, positioning the ink bag in a vacuum chamber, advancing a tip of an ink needle into the interior of the flexible bag portion by passing the tip of the needle through the second opening, and pressing the ink bag with a pressing plate to cause a quantity of residual ink to be discharged through the second opening. Another step is charging the ink bag only through the second opening with a specified quantity of ink in a vacuum.

Claim 4 is drawn to a method of refilling an ink bag for use in an ink jet recorder, the ink bag being initially filled with ink through a first opening in the bag that is sealed after the ink bag is initially filled. This method includes the steps of providing the ink bag, the ink bag having, disposed on a line, the first opening and an opposing second opening that is an ink supply port selectively engageable with an ink jet recorder, positioning the ink bag in a vacuum

chamber, advancing a tip of an ink needle along the line and through the second opening in the ink bag, pressing the ink bag with a pressing plate to cause a quantity of residual ink to be discharged through the second opening, and charging the ink bag only through the second opening with a specified quantity of ink in a vacuum.

Claim 14 is drawn to a method of refilling an ink bag for use in an ink jet recorder, the ink bag having a flexible bag portion having an interior and being initially filled with ink through a first opening formed by a part of the flexible bag portion and which first opening is sealed after the ink bag is initially filled. This method involves providing an ink bag, the ink bag having a second opening formed in a port attached to another part of the flexible bag portion and that is different than the first opening, the second opening being an ink supply port selectively engageable with the ink jet recorder, positioning the ink bag in a vacuum chamber, advancing a tip of an ink needle into the interior of the flexible bag portion by passing the tip of the needle through the second opening in the port, pressing the ink bag with a pressing plate to cause a quantity of residual ink to be discharged through the second opening, and charging the ink bag only through the second opening in the port with a specified quantity of ink in a vacuum.

Applicants' invention, according to claim 15, is a method of refilling an ink bag for use in an ink jet recorder, the ink bag being initially filled with ink through a first opening formed by a part of the flexible bag portion and which first opening is sealed after the ink bag is initially filled. The method includes the steps of providing the ink bag, the ink bag having, disposed on a line, the first opening and an opposing second opening formed in a port attached to another part of the flexible bag portion, the second opening being an ink supply port selectively engageable with an ink jet recorder, positioning the ink bag in a vacuum chamber, advancing a tip of an ink needle along the line and through the second opening in the port, pressing the ink

bag with a pressing plate to cause a quantity of residual ink to be discharged through the second opening, and charging the ink bag only through the second opening in the port with a specified quantity of ink in a vacuum.

As will be explained below, these claims patentably distinguish over the cited combination of references because that combination fails to suggest all the features of the claimed invention.

First, it is respectfully submitted that the outstanding rejection is defective because it fails to make findings of fact with regard to the level of ordinary skill in the art. Such a finding is one of three different factual findings that the U.S. Patent and Trademark Office ("USPTO") requires for an obviousness rejection under 35 U.S.C. § 103(a). Specifically, the USPTO recently stated that:

[a]s reiterated by the Supreme Court in KSR, the framework for the objective analysis for determining obviousness under 35 U.S.C. 103 is stated in Graham v. John Deere Co. (citation omitted) Obviousness is a question of law based on underlying factual inquiries. The factual inquiries enunciated by the Court are as follows:

- (1) Determining the scope and content of the prior art;
- (2) Ascertaining the differences between the claimed invention and the prior art; and
- (3) **Resolving the level of ordinary skill in the pertinent art.**

Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in KSR International Co. v. Teleflex Inc., 72 Fed. Reg. 57526, 57527 (October 10, 2007) (emphasis added).

The Office Action fails to comply with these Examination Guidelines; no findings were made with regard to the level of ordinary skill in the art at the time this invention was made. Applicants respectfully submit that such a finding is particularly important to prevent the impermissible use of hindsight in assessing whether the prior art suggests an invention where, as

here, an extended time has passed since the invention was made (this application has an effective U.S. filing date of November 13, 1997, and claims 1996 and 1997 Japanese priority dates). It also should be noted that the Examination Guidelines state "[i]n certain circumstances, it may also be important to include explicit findings as to how a person of ordinary skill would have understood prior art teachings, or what a person of ordinary skill would have known or could have done" id. at 57527. It is respectfully submitted that this application presents precisely the type of situation where the Examination Guidelines encourage the setting forth of thorough factual findings regarding the level of ordinary skill in the art.

Applicants further submit that, because at the time this invention was made some ten years ago, much less was known about the field of the invention, the general level of skill in the art would have been such as to require clear and unambiguous teachings that would lead one of ordinary skill to modify any relevant prior art to arrive at the claimed invention.

Turning to the cited references, Applicants respectfully submit that the combination of those references fails to suggest all the features of the claimed invention.

Vollert

Vollert just teaches refilling component receptacles (ink containers), each having a flexible ink bag, through the same port that is connected to the printhead. Vollert accomplishes refilling by placing refill receptacles storing the new ink in communication with the component receptacles and then tilting the joined component receptacles and ink receptacles (see Fig. 2). Vollert points out that the ink will flow slowly from the refill receptacle to the ink receptacle (translation, page 6), and that this delay is not important.

Vollert therefore fails to teach any desirability of (1) emptying a spent ink bag prior to refilling, (2) causing such emptying by pressing the ink bag with a pressing plate, (3)

placing the spent ink bag in a vacuum chamber as part of the refilling process, or (4) charging the spent and pressed ink bag while that ink bag is in a vacuum. In particular, it is noted that the Office Action at page 3 **admits** Vollert fails to disclose points (1) and (2), and it is submitted that one skilled in the art would understand from Vollert that the component receptacles being refilled are held at atmospheric pressure, not in a vacuum.

Again, it should be kept in mind that Vollert does not even suggest either the aspect of this invention involving placing the ink bag in a vacuum chamber, or charging the spent ink bag with ink while in a vacuum.

Having acknowledged Vollert's deficiencies, the Office Action looks to Scheffelin to remedy those deficiencies.

Scheffelin

The Office Action looks to Scheffelin as teaching draining an ink cartridge prior to refilling, and contends one skilled in the art would combine Scheffelin with Vollert to arrive at the claimed invention. However, this reasoning fails for at least the following points.

Scheffelin teaches a very different ink cartridge filling system than that which is claimed. In Scheffelin, a hard-walled print cartridge 16 has an internal ink bag structure 51, and side plates 58, 59 pretensioning a bow spring 56 to provide a constant outward force on the ink bag sidewalls 61, 62, so that there is always negative pressure in the ink bag (col. 5, lines 44-64). As ink leaves the cartridge, the ink bag 51 collapses (col. 6, lines 5-6). Those skilled in the art will understand that Scheffelin's structure thereby maintains the interior of the ink bag at negative pressure as ink is consumed.

Scheffelin then teaches refilling the ink bag with ink 151 from a separate ink container 150 while the ink bag 51 remains within the ink cartridge body (see Fig. 20) in a

manner that preserves the negative pressure within the ink bag 51, which those skilled in the art will recognize can prevent later ink leakage. The force that draws ink into the ink bag 51 of the ink cartridge is the negative pressure generated therein (col. 11, lines 14-18), which, it will be appreciated, results from the action of the cartridge's bow spring 56, side plates 58, 59 and ink bag sidewalls 61, 62. Scheffelin notes that the refilling process is slow due to the low negative pressure in the ink bag 51, and can take several minutes (col. 11, lines 16-18).

Although the Office Action at page 3 contends that Scheffelin (col. 13, lines 5-10) teaches using a plunger and syringe to apply negative pressure in ink bag 51 to cause negative pressure in ink bag 51 that presses the ink bag, this still is not the same as the claimed invention. While Scheffelin may teach applying suction to the ink in ink bag 51 to evacuate that bag and produce negative pressure therein, that still is different from, and not suggestive of, applying pressure to the exterior of the ink bag in the manner claimed, which increases pressure in the ink bag and thereby drives ink outward from the ink bag. The Office Action admits this (page 4, first bulleted paragraph), and then looks to a different reference.

In fact, following Scheffelin's teachings and using only suction to evacuate an ink bag may be undesirable because, as pointed out in the specification of this application at page 16, second full paragraph, that can deform the ink bag, which can be a problem.

Also, it will be appreciated that Scheffelin, like Vollert, does not even suggest either the aspect of this invention involving placing the ink bag in a vacuum chamber, or charging the spent ink bag with ink while in a vacuum.

Heinzl

Having admitted that neither Vollert nor Scheffelin teaches pressing an ink bag, the Office Action looks to Heinzl to remedy such deficiencies.

While Heinzl teaches applying pressure to ink with a pressure applying member, Heinzl applies such pressure when commencing routine printing to insure the printer's entire ink supply system is filled with ink and any air in the ink supply system is eliminated (abstract; col. 5, lines 26-38). Heinzl is not concerned with refilling a spent ink bag, meaning one skilled in the art seeking to overcome the deficiencies of Vollert and Scheffelin would not look to Heinzl.

Applying pressure during routine printing, not during refilling, is an important distinction. That distinction resulted in the withdrawal of a prior rejection based in part upon a reference teaching such an application of pressure. Applicants' Response filed on March 14, 2007, pointed out, in traverse of a rejection under § 103(a) based upon Vollert, Scheffelin and U.S. patent no. 4,586,058 to Yamazaki et al., that Yamazaki used a compressing device to apply pressure to ink in the printer during routine printing, and that rejection was withdrawn.

Since the teachings of Heinzl with regard to the application of pressure to an ink bag involve, like Heinzl, routine printing, not refilling, Heinzl suffers from the same shortcomings as Yamazaki, and so for the same reasons Heinzl fails to even suggest the claimed invention.

Furthermore, it should be noted that whereas the present invention relates to refilling ink in a spent ink bag, Heinzl specifically states that a spent ink supply container should be **discarded**: "[t]he entire ink supply container can be thereafter discarded since it represents a relatively inexpensive construction" (col. 5, lines 15-17), meaning Heinzl disparages and so teaches away from the present invention.

Consequently, even if Vollert, Scheffelin and Heinzl are taken together, that combination would, at most, suggest evacuating a single-use, non-refillable ink bag using only vacuum, not a pressing plate, and then applying pressure during routine printing.

Since the Office Action omits the necessary finding as to the level of ordinary level of skill in the art, and the cited combination of references fails to suggest at least the aspects of the claimed invention involving the use of a pressing plate to press the spent ink bag, positioning the spent ink bag in a vacuum chamber, and/or charging the ink bag in a vacuum, the present rejection is not well-taken, and so must be withdrawn.

The pending dependent claims distinguish over the cited art at least for the reasons already given with regard to their respective base claims.

For all the foregoing reasons, favorable reconsideration and withdrawal of this rejection are respectfully requested.

CONCLUSION

Other than the extension fee authorized in the accompanying Petition For Extension of Time, no fees are believed to be due in connection with the filing of this paper. Nevertheless, the Commissioner is authorized to charge any fee now or hereafter due required during the prosecution of this application to Deposit Account No. 19-4709.

Prompt and favorable consideration are respectfully requested.

Respectfully submitted,

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